

1

2

3 **Coercion and HIV Self-Testing in Men Who Have Sex with Men: Implementation Data**
4 **from a Cross-Sectional Survey in China**

5

6 Jason J. Ong PhD^{1-3*}, Haochu Li PhD^{4*}, Wu Dan PhD², Hongyun Fu PhD^{2,5}, Ewen Liu⁶,
7 Wei Ma PhD⁴, Dianmin Kang MD⁷, Meizhen Liao PhD⁷, Gifty Marley MMed⁴, Chongyi
8 Wei DrPH⁸, Weiming Tang PhD^{2,6,9,10,11}, Stephen Pan PhD^{2,5}, Chuncheng Liu BA², Nicola
9 Desmond PhD¹², Bin Yang MD^{9,10,11}, Ligang Yang MD^{9,10,11}, Shujie Huang MS^{9,10,11},
10 Joseph D. Tucker PhD^{1,2,5§}

11

12 * Equal first authors

13

14 ¹ Department of Global Health and Development, London School of Hygiene and Tropical
15 Medicine, London, United Kingdom

16 ² Social Entrepreneurship for Sexual Health (SESH) Global, Guangzhou, China

17 ³ Central Clinical School, Monash University, Victoria, Australia

18 ⁴ School of Public Health, Shandong University, Jinan, China

19 ⁵ Eastern Virginia Medical School, Norfolk, USA

20 ⁶ University of North Carolina at Chapel Hill, North Carolina, USA

21 ⁷ Shandong Centre for Disease Control and Prevention, Jinan, China

22 ⁸ School of Medicine, University of California, San Francisco, USA

23 ⁹ Guangdong Provincial Centre for Skin Disease and STI Control, Guangzhou, China

24 ¹⁰ Dermatology Hospital, Southern Medical University, Guangzhou, China

25 ¹¹ Guangdong Dermatology Hospital, Guangzhou, China

26 ¹² Department of International Public Health, Liverpool School of Tropical Medicine,
27 Liverpool, United Kingdom

28

29 § Corresponding author: Joseph D. Tucker

30 University of North Carolina Chapel Hill Project-China

31 Number 2 Lujing Road, Guangzhou, China, 510095

32 Email: jdtucker@med.unc.edu

33 Tel: +86 13560294997

34

35 **Running head:** HIV test coercion in Chinese MSM

36

37 **Conflicts of interest and sources of funding**

38 All authors declare there are no conflicts of interest. Funding has been received from the
39 National Institutes of Health (NIAID 1R01AI114310-01), UNC-South China STD Research
40 Training Center (FIC 1D43TW009532-01), UNC Center for AIDS Research (NIAID
41 5P30AI050410), UCSF Center for AIDS Research (NIAID P30 AI027763), National
42 Institute of Mental Health (R00MH093201), UJMT Fogarty Fellowship (FIC R25TW0093),
43 Australian National Health and Medical Research Council (APP1104781) and SESH Global
44 (www.seshglobal.org). Administrative assistance from the Guangdong Provincial Center for
45 Skin Diseases and STI Control. UNC Chapel Hill, and UNC Project-China in Guangzhou,
46 China.

47

48 *To the Editors:*

49

50 **INTRODUCTION**

51 HIV self-testing (HIVST) scale up may help achieve the first 90 within the UNAIDS 90-90-
52 90 targets.¹ HIVST is defined as a process in which a person collects his/her own specimen
53 (oral fluid or blood) and then performs a test and interprets the result, often in a private
54 setting, either alone or with someone he or she trusts.² New World Health Organization
55 (WHO) guidelines supporting HIVST have provided momentum for self-testing.²

56

57 Although HIVST increases agency about when, where, and with whom to test,^{3,4} one
58 unintended consequence may be an increase in coercive HIV testing. We define coercion as
59 being *forced* to test. This may be through physical means (with actual violence or threat of
60 violence) or could involve threats to take away something if the person does not do the test
61 (e.g. losing their job, breaking up a relationship, not having sex). The WHO and others state
62 that HIV testing must be voluntary.^{2,5} However, cases of coerced testing have been observed
63 among women forced by their employers (both in sex work and non-sex work settings),^{3,6}
64 detained individuals (prisoners, drug users, sex workers) forced by institutions,^{7,8} and young
65 people forced by their sex partners.³ In China, there is an emphasis on public health responses

66 focused on expanding key population HIV testing and a history of compulsory HIV testing
67 among several subpopulations.⁹ For example, in 1995, a Chinese law required premarital HIV
68 testing,¹⁰ and sex workers and drug users often receive compulsory testing in detention
69 settings.^{7,9,11}

70
71 In recent years, China has rapidly scaled up HIVST, partly driven by a thriving online self-
72 test kit market¹². Surveys of men who have sex with men (MSM) report that approximately a
73 third have already used HIV self-testing¹³. In a setting where HIV testing has become more
74 decentralized, it is unknown if coercion may be occurring. We aimed to examine the
75 prevalence and correlates of coerced HIV testing amongst MSM in China.

77 **METHODS**

78 From July to August 2016, an online, cross-sectional study among Chinese MSM was
79 conducted. At the time of recruitment, these men were living in one of eight cities in
80 Guangdong Province (Guangzhou, Jiangmen, Zhuhai, Shenzhen) or Shandong Province
81 (Yantai, Jinan, Qingdao, Jining). Advertisements were distributed through Blued (Blue
82 Brother, Beijing, China), a social networking mobile phone application for MSM, used by
83 approximately 40 million users. Inclusion criteria were men born biologically male, aged \geq
84 16 years, who had ever had sex with another man, and had ever tested for HIV.

85
86 Demographic variables included their age, education level, marital status, annual income and
87 household residency status. Sexual history included their sexual orientation, disclosure of
88 sexuality or sexual history with men other than regular partner, disclosure of sexuality or
89 sexual history to health providers, where they usually met their sexual partners, consistency
90 of condom use for anal sex in the preceding three months, any casual male partner(s) in the
91 preceding three months. The level of community engagement in sexual health was defined
92 through six questions.¹⁴

93
94 HIV testing behaviours included whether past testing was through facility and/or HIVST kits,
95 whether the HIVST kit was provided by someone else, and whether other people were
96 present during their last HIVST. Men who experienced HIV test coercion were identified
97 from the questions: "Did someone else (partner, boss, friend, or others) force you to take an

98 HIV test (facility based test?)” and “Did someone else (partner, boss, friend, or other) force
99 you to take an HIV self-test?”.

100

101 Descriptive analysis was conducted to summarize the demographic, behavioural, and HIV
102 testing experience. χ -squared tests were used to test for statistically significant differences
103 ($p < 0.05$) in reporting of HIV test coercion between men who reported using HIVST and
104 those who have not used HIVST. Bivariable and multivariable logistic regression were
105 conducted to explore factors associated with reported HIV test coercion. Each multivariable
106 model was built using results from a literature search and expert consensus from
107 collaborators to select potential confounders. Model adjustment controlled for confounding
108 by variables identified through directed acyclic graphs.¹⁵ Each variable was examined
109 independently in separate regression models, adjusted for age, education, annual income and
110 household registration status. All analyses were conducted using STATA software (StataCorp,
111 College Station, TX, USA).

112

113 Ethical approval was obtained from the ethics review committees at the Guangdong
114 Provincial Centre for Skin Diseases and STI Control, the University of North Carolina at
115 Chapel Hill, and the University of California, San Francisco.

116

117 **RESULTS**

118 One thousand three hundred and twelve MSM reported having ever tested for HIV.
119 Respondents were young (mean age 26.9 ± 6.3), and about two-thirds (69%) had an above
120 high school level education. The majority (76%) self-identified as gay and a third (31%)
121 reported condomless anal sex in the last 3 months.

122

123 The majority had ever tested in a facility (86%, $n=1,125$). About half had ever self-tested
124 (52%, $n=685$), and about a third had used both facility-based testing and HIVST (38%,
125 $n=498$). A third of those who used HIVST, reported receiving HIVST kits from other people
126 (35%, $243/685$). During the last HIVST conducted, 66% ($455/685$) were alone, 24%
127 ($162/685$) had a partner present, 9% ($65/685$) had a friend present and 1% ($4/685$) had a
128 family member present.

129

130 Overall, 64 men (5%) reported ever experiencing HIV test coercion: 8% (52/685) in men who
131 had used HIVST compared to 2% (12/627) for men who had not used HIVST ($p < 0.001$).

132

133 Bivariable and multivariable logistic regression results are presented in Table 1. In summary,
134 men who reported HIV test coercion were more likely to have used HIVST (adjusted odds
135 ratio(AOR) 4.25 (95% confidence interval (CI):2.23-8.09), received a HIVST kit from
136 another person (AOR 3.47, 95% CI:1.90-6.32), primarily met sexual partners through
137 parks/public restrooms/public lawns (AOR 3.45, 95% CI:1.09-10.95), and reported
138 condomless sex in the last three months (AOR 2.38, 95% CI:1.43-3.98).

139

140 **DISCUSSION**

141 Our study suggests that HIVST may be associated with coercion among Chinese MSM. This
142 is consistent with qualitative studies on self-testing¹⁶, but to our knowledge has not been
143 described in quantitative research. The relationship between coercion and HIV self-testing
144 may be influenced by China's relatively permissive regulatory environment^{4,17}, few
145 formalized resources for self-testing, and underlying social contexts such as power
146 imbalances. Our findings underscore the importance for policies to be in place to monitor for
147 potential harms of HIV self-testing. Especially in settings where power imbalances may exist
148 among those seeking HIV testing, there is a risk of overriding the human rights of vulnerable
149 populations who may not report that they are being coerced⁷.

150

151 We also found that MSM with more condomless sex were more likely to experience coerced
152 HIV testing. This is the first report of this finding within the current literature on HIV test
153 coercion in MSM. One hypothesis to explain our findings may be that men force high-risk
154 sex partners to receive HIV testing, sometimes called "point-of-sex" testing. This trend has
155 been reported predominantly amongst MSM in the US.¹⁸⁻²⁰ MSM may use point-of-sex
156 testing as a risk reduction technique to screen sexual partners before sex, despite its limitation
157 related to the window period. MSM using point-of-sex testing reported a high yield of HIV
158 positive results (~10%) and high percentage of partners who were not aware that they were
159 HIV positive (~60%).¹⁹ Although there is enthusiasm for utilizing mutual partner testing to
160 increase awareness of risk and decrease condomless sex between discordant partners,²¹ future
161 studies on examining point-of-sex testing should also include measurements of the potential
162 harms of test coercion.

163 The study should be interpreted in light of some limitations. This was a quantitative study of
164 men reporting coercion, and further qualitative studies are needed to expand on the contexts
165 of coercion. Power relationships are not dichotomous and there may be a spectrum of agency
166 for choosing to test or not to test. Understanding power differentials is important as it may
167 impact on the recognition of what constitutes coercion. MSM living in China are a hidden
168 population, and we tried to maximize representativeness by sampling from multiple locations
169 and utilizing an anonymous online survey. However, these findings from an online sample of
170 MSM are unlikely to be representative of all MSM in China as men we sampled are younger
171 and better educated. Nevertheless, it indicates that a substantial number of young MSM in
172 China have used HIV self-test kits and highlights the possibility of HIV test coercion
173 amongst this subgroup of MSM who use gay social networking apps.

174

175 As countries continue to scale up HIV testing, including increasing access to HIVST, our
176 findings suggest that coercion may be occurring among some MSM. Policies should be in
177 place to monitor and measure for potential harms associated with HIV testing. Targeted
178 messaging in programs promoting HIV testing should emphasize that every HIV test should
179 be voluntary²². Future research should include more representative samples and an
180 assessment of the contexts that characterize coerced HIVST, in order to inform interventions
181 to prevent it.

182

183 **Competing interests**

184 All authors declare they do not have any competing interests.

185

186 **Acknowledgement**

187 We thank all men who participated in the study. We would like to thank Southern Medical
188 University and the SESH team for administrative assistance.

189

190 **Authors' contributions**

191 JDT, HL, and CL contributed to the conception and design of the study. CW, BY provided
192 oversight for data collection, and WM, DK, ML, GM, LY, and SH assisted in the data
193 collection. EL assisted with the literature search. JJO analysed the data and drafted the paper.
194 All authors revised the manuscript and approved the final version to be published.

195

196 **Funding**

197 National Institutes of Health (NIAID 1R01AI114310-01), UNC-South China STD Research
198 Training Center (FIC 1D43TW009532-01), UNC Center for AIDS Research (NIAID
199 5P30AI050410), UCSF Center for AIDS Research (NIAID P30 AI027763), NIMH
200 (R00MH093201), UJMT Fogarty Fellowship (FIC R25TW0093), Australian National Health
201 and Medical Research Council (APP1104781) and SESH Global (www.seshglobal.org).
202 Administrative assistance from the Guangdong Provincial Center for Skin Diseases and STI
203 Control. UNC Chapel Hill, and UNC Project-China in Guangzhou, China.

205 **REFERENCES:**

- 206 1. Barnhart S. PEPFAR: is 90-90-90 magical thinking? *Lancet*. 2016;387(10022):943-944.
207 2. World Health Organization. Guidelines on HIV self-testing and partner notification.
208 December 2016.
209 <http://apps.who.int/iris/bitstream/10665/251655/1/9789241549868-eng.pdf?ua=1>.
210 Accessed 16th March 2017.
211 3. Figueroa C, Johnson C, Verster A, Baggaley R. Attitudes and Acceptability on HIV Self-testing
212 Among Key Populations: A Literature Review. *AIDS and Behavior*. 2015;19(11):1949-1965.
213 4. Tao J, Li M-y, Qian H-Z, et al. Home-Based HIV Testing for Men Who Have Sex with Men in
214 China: A Novel Community-Based Partnership to Complement Government Programs. *PLOS*
215 *ONE*. 2014;9(7):e102812.
216 5. Bernard M. Branson HHH, Margaret A. Lampe, Rovert S. Janssen, Allan W. Taylor, Sheryl B.
217 Lyss, Jill E. Clark. Revised Recommendations for HIV Testing of Adults, Adolescents, and
218 Pregnant Women in Health-Care Settings. 2006.
219 6. Paxton S, Gonzales G, Uppakaew K, et al. AIDS-related discrimination in Asia. *AIDS care*.
220 2005;17(4):413-424.
221 7. Cohen JE, Amon JJ. Health and Human Rights Concerns of Drug Users in Detention in
222 Guangxi Province, China. *PLoS medicine*. 2008;5(12):e234.
223 8. Bell E, Mthembu P, O'Sullivan S, Moody K. Sexual and Reproductive Health Services and HIV
224 Testing: Perspectives and Experiences of Women and Men Living with HIV and AIDS.
225 *Reproductive Health Matters*. 2007;15(29, Supplement):113-135.
226 9. Wu Z, Sullivan SG, Wang Y, Rotheram-Borus MJ, Detels R. Evolution of China's response to
227 HIV/AIDS. *The Lancet*. 369(9562):679-690.
228 10. Wu Z, Rou K, Cui H. The HIV/AIDS Epidemic in China: History, Current Strategies and Future
229 Challenges. *AIDS Education and Prevention*. 2004;16(supplement_a):7-17.
230 11. Wu Z. Arguments in favour of compulsory treatment of opioid dependence. *Bull World*
231 *Health Organ*. 2013;91(2):142-145.
232 12. Liu F, Han L, Tang W, et al. Availability and Quality of Online HIV Self-Test Kits in China and
233 the United States. CROI; 2015; Seattle.
234 13. Qin Y, Liu F, Tang W, et al. HIV self-testing among high-risk men who have sex with men in
235 China: a cross-sectional study. *Lancet*. 2016;388 Suppl 1:S76.
236 14. Group SS. Community engagement in sexual health and uptake of HIV testing and syphilis
237 testing among MSM in China: a cross-sectional online survey. *J Int AIDS Soc*. 2017;20(1):1-10.

- 238 15. Greenland S, Robins JM, Pearl J. Confounding and collapsibility in causal inference. *Statistical*
239 *Science*. 1999;29-46.
- 240 16. Qin Y. The social context of HIV self-testing: a global qualitative evidence synthesis. 21st
241 International AIDS Conference; 2016; Durban, South Africa.
- 242 17. Han L, Bien CH, Wei C, et al. HIV self-testing among online MSM in China: implications for
243 expanding HIV testing among key populations. *Journal of acquired immune deficiency*
244 *syndromes*. 2014;67(2):216-221.
- 245 18. Katz D, Golden M, Stekler J. Point of sex testing: Intentions of men who have sex with men
246 to use home-use HIV tests with sex partners. Paper presented at: 2012 National Summit on
247 HIV and Viral Hepatitis Diagnosis, Prevention and Access to Care. Washington, DC.
- 248 19. Carballo-Diequez A, Frasca T, Balan I, Ibitoye M, Dolezal C. Use of a rapid HIV home test
249 prevents HIV exposure in a high risk sample of men who have sex with men. *AIDS and*
250 *behavior*. 2012;16(7):1753-1760.
- 251 20. Carballo-Diequez A, Frasca T, Dolezal C, Balan I. Will gay and bisexually active men at high
252 risk of infection use over-the-counter rapid HIV tests to screen sexual partners? *Journal of*
253 *sex research*. 2012;49(4):379-387.
- 254 21. Wood BR, Ballenger C, Stekler JD. Arguments for and against HIV self-testing. *HIV AIDS*
255 *(Auckl)*. 2014;6:117-126.
- 256 22. UNAIDS. A short technical update on self-testing for HIV. 2013.
257 [http://www.unaids.org/sites/default/files/media_asset/JC2603_self-](http://www.unaids.org/sites/default/files/media_asset/JC2603_self-testing_en_0.pdf)
258 [testing_en_0.pdf](http://www.unaids.org/sites/default/files/media_asset/JC2603_self-testing_en_0.pdf). Accessed 28th September 2017.

260

Table 1 – Factors associated with ever experiencing HIV test coercion in men who have sex with men in China, 2016 (N=1,312)

Variable	Crude odds ratio	p value	Adjusted odds ratio*	p value
Demographics				
<i>Marital status</i>				
- Never married	1		1	
- Engaged or married	1.99 (1.01-3.93)	0.05	2.03 (0.90-4.58)	0.09
- Divorced or widowed	0.54 (0.13-2.25)	0.39	0.54 (0.12-2.53)	0.44
Sexual History				
<i>Sexual orientation</i>				
- non-gay	1		1	
- gay	0.72 (0.41-1.25)	0.24	0.70 (0.96-1.04)	0.21
<i>Disclosure of sexuality or sexual history with men (other than regular partner)</i>				
- No disclosure	1		1	
- Disclosure	1.25 (0.69-2.26)	0.46	1.26 (0.69-2.30)	0.46
<i>Disclosure of sexuality or sexual history with health providers</i>				
- No disclosure	1		1	
- Disclosure	1.07 (0.60-1.92)	0.82	1.09 (0.60-1.96)	0.79
<i>Sexual partners in last 12 months mainly from</i>				
- social media/website	1		1	
- friends	0.88 (0.37-2.09)	0.77	0.78 (0.32-1.88)	0.58
- pub, disco, club	2.23 (0.77-6.45)	0.14	1.90 (0.63-5.71)	0.25
- spa, bath house, sauna	3.13 (1.07-9.15)	0.04	2.94 (0.95-9.06)	0.06
- park, public restroom, lawn	4.17 (1.40-12.38)	0.01	3.45 (1.09-10.95)	0.04
- other	0.82 (0.20-3.47)	0.79	0.65 (0.15-2.81)	0.57
- unknown	0.27 (0.08-0.89)	0.03	0.33 (0.10-1.08)	0.07
<i>Condomless sex in last 3 months</i>	2.14 (1.18-3.88)	0.01	2.38 (1.43-3.98)	<0.001
<i>Casual partner in last 3 months</i>	1.64 (0.99-2.72)	0.06	1.65 (0.98-2.76)	0.06
<i>Community engagement in sexual health</i>				
- No engagement	1		1	
- Minimal engagement	2.29 (0.57-9.10)	0.24	2.07 (0.51-8.29)	0.31
- Moderate engagement	1.10 (0.33-3.74)	0.88	1.01 (0.29-3.45)	0.99
- Substantial engagement	2.65 (0.79-8.86)	0.11	2.38 (0.71-8.04)	0.16
HIV testing behaviour				
<i>Ever used HIV facility testing</i>				
- No facility HIV test	1		1	
- Facility HIV test	0.71 (0.37-1.35)		0.68 (0.35-1.32)	0.26
<i>Ever used HIVST</i>				
- No HIVST	1		1	
- HIVST	4.23 (2.24-8.00)	<0.001	4.25 (2.23-8.09)	<0.001
<i>Received HIVST kit from other people[#]</i>	3.50 (1.94-6.30)	<0.001	3.47 (1.90-6.32)	<0.001
<i>Partner present at last HIVST[#]</i>	1.21 (0.64-2.29)	0.56	1.14 (0.60-2.19)	0.69
<i>Friend present at last HIVST[#]</i>	1.54 (0.67-3.58)	0.31	1.48 (0.63-3.47)	0.37
<i>Post test violence</i>	66.63 (21.62-205.36)	<0.001	43.00 (13.41-137.91)	<0.001

HIVST = HIV self-test; *Adjusted for age, income, education, household residency status; [#] for 685 men who had HIV self-tested